

forced only to the extent of turning a sufficient amount of water into steam to occupy the full area of the hottest tubes at their highest point. Any further forcing with this type of boiler will cause it to destroy itself.

Exactly what the last word in boiler design will be is hard to say. Present designs leave much to be desired, not only in the circulation of the water, but in the manner in which the hot gases pass through the setting and come in contact with the heating surface. The ruling temperature of boilers is very low. Convection currents in water are set up with very low-temperature differences, and as the temperature of the mass increases the convection head caused by one degree difference in temperature increases. These physical principles do not cause design difficulties and it is probably for this reason that boiler engineering has settled into a rut and the mechanical details of the connections entirely overshadow the importance of increasing the heat-absorbing capacity.

SUGGESTIONS FOR CORRECT BOILER

BAFFLING

BY A. D. WILLIAMS

HEATING or the application of heat to industrial and domestic processes is an engineering problem of importance. A study of existing installations reveals many interesting discrepancies in practice. In writing about heating furnace a great deal has been said regarding the importance of permitting the heat to soak in. It is well known that a time factor is necessary. The velocity of gas travel is very low in many furnaces. But when boiler settings are considered, a great deal is said regarding the importance of high gas velocities as contributing to efficient operation.

The ideal condition is found between these two extremes. In boiler practice the problem is to pass the gases

by the recipient
surface at a velocity which will permit them to give
up or transfer
all of the heat they carry between two temperature
limits. Their
initial or high temperature limit is fixed by the
firebox or com-
bustion temperature. Their final or low
temperature limit is
fixed by the ruling temperature, or temperature of
regime, of the
boiler plus the temperature required to supply a
temperature head
necessary for the transfer of heat. This final
temperature of the